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CHEMICAL & ENGINEERING

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Palytoxin

Chemist succeeds in synthesizing coral toxin with 64 dissymmetric carbons **Page 23**

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NEWS
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SEPTEMBER 18, 1989

News of the Week

- **Seventy national delegations meet to negotiate bilateral chemical weapons agreement.** Page 4
- **Global environmental chemistry issues prominent at ACS Miami Beach meeting.** Page 5
- **Chemists at Brookhaven National Labs discover new form of "hot" fusion.** Page 6
- **New approach to drug efficacy testing for AIDS patients endorsed by medical panel.** Page 6
- **Savannah River reactor in South Carolina to resume tritium production in late 1990.** Page 7
- **Dow Chemical, Sikorsky Aircraft division of United Technologies agree to joint composites venture.** Page 7
- **Polymerization processes unveiled by GE chemists promise new carbonates applications.** Page 8
- **New survey of biomass of North American forests shows 75% less than previously calculated.** Page 8

Cover: Organism *Palythoa toxica*, source of extremely poisonous palytoxin, is actually a coral found in single tide pool in Maui. Photo by S. Arthur Reed of the University of Hawaii, Manoa

Letters 2

Concentrates
Business 9
Government 17
Science/Technology 20

The Departments
ACS News 33
Meetings 39
Newscripts 56

Business

Avtex Fibers faces some tough tests as it deals not only with charges that its Virginia plant polluted river with PCBs but also with profitability problems. **Page 11**

The $470 million Bhopal settlement is held up in a review process by India's Supreme Court amid charges that government sold out victims in settlement. **Page 15**

Government

President Bush's proposed global-change program aims to coordinate environmental research of federal agencies in effort to provide policymakers with sound scientific information on environment. **Page 18**

Science/Technology

New IUPAC program, "Chemistry in Action," calls for organization to involve itself in a number of chemistry-based topics that are global in context. **Page 25**

Software for 3-D molecular structure searching offers powerful new dimension for molecular modeling, rational design of drugs. **Page 28**

Awards

ACS award winners: Allinger, Bercaw, Bishop, Bockrath, Brossi, Chen, Field, Kinsey, Fraser-Reid, and Freiser. **Page 35**

Cover Story

Total synthesis of coral toxin palytoxin, a giant molecule that weighs in at 2660 daltons and has 10^{21} possible isomers, achieved by Harvard chemists. **Page 23**

Chemical & Engineering News
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LETTERS

Encourage women scientists

SIR: The concept of exposing high school students to applied science at Rose-Hulman Institute of Technology by Noel Moore and Operation Catapult (C&EN, July 10, page 25) deserves praise. This summer program is able to accomplish two very important objectives: promoting science while motivating young people.

One problem that concerns me about the implementation of this concept into an actual working program is that only half of the eligible high school population is offered this summer opportunity. You see, women are currently ineligible to participate because the college where the program is held is not coeducational. It is a shame that women are denied participation in this unique summer program on the sole basis of gender.

Young women with an interest in science are just as keen as young men in pursuing high-quality, unique, summer science programs. There are currently few programs of this caliber available, and if I were still a high school student, this program would be high on my priority list. I would experience real disappointment at being denied participation simply because I lacked a Y chromosome.

My suggestion is to make this program available to all promising students of science. (After all, there seem to be so few of them to begin with.) Here are three bold suggestions:

- Declare that both summer sessions will be coeducational and invite women to participate in either session. If necessary, employ one or more females to act as dormitory chaperones.
- Declare that one summer session is for men and that the other is for women.
- Establish a sister program at a nearby college that will offer Operation Catapult to women.

If for ideological or financial reasons these options are unfeasible, then I am truly disappointed. As professionals, we need to encourage all young people in the sciences, no matter what their gender.

Christina Schwerdtfeger
Los Angeles

Energy consumption growth

SIR: The early euphoria over the announcement of the discovery of room-temperature fusion led the press to speculate about the enormous benefits of a new source that might produce "energy that was too cheap to meter." The tragic implications of such a discovery have not been examined.

Every sector of society thrives on growth. The dominant belief is that we need more people, more jobs, more materials consumed, and more energy consumption per person per year. Annual growth rates of only a few percent characterize a recession and rates in the double-digit range are said to be healthy or robust. The availability of unlimited energy would seem to remove one of the major limits to growth so that rates of energy consumption could grow indefinitely.

The problem is this. Essentially all the energy we consume appears ultimately as heat in the environment. Human activities today put into the global environment about 10^{-4} of the energy the sun puts into the global environment. Simple arithmetic shows that a factor of 10^4 can be gained by growth through only 14 doubling times, at which point the arithmetic would say that human activity was putting as much energy into the global environment each day as the sun puts in. Such a situation would be much worse than intolerable.

Question: If we had abundant low-cost energy, is there any evidence that humans could get together to stop the growth of the rate of energy consumption in order to save ourselves?

Albert A. Bartlett
Professor Emeritus
University of Colorado, Boulder

Cold fusion, superconductivity

SIR: Cold fusion and superconductivity (C&EN, July 10, pages 5 and 19) are the hottest items that have hit the scientific community in 40 years.

Between backswings and backcasts, please let me comment on these articles. In the first article, General Electric Co. and the University of Utah sign a joint agreement to study and develop cold fusion phenomenon. GE has a long history of multilateral agreements with government and academia in cooperative research, especially nuclear energy. However, it seems to have stolen the show in landing a bilateral agreement with Utah "by positioning itself at the cutting edge of research in the exciting new area of energy development with the opportunity to license any promising technology."

However, nuclear physicist Martin Deutsch of Massachusetts Institute of Technology speaks very disparagingly of this marriage. But this sounds like sour grapes. The jury is still out on the viability of cold fusion. In the meantime GE's agreement with Utah is a legal/administrative coup—especially since most of the high-powered industrial,

Avtex Fibers Hit by Mounting Pollution, Profitability Problems

Charges that Virginia plant is discharging PCBs into river coupled with earlier charges, continuing profits squeeze threaten fiber maker's health

Marc S. Reisch,
C&EN Northeast News Bureau

Avtex Fibers has displayed a remarkable ability to bounce back in the face of adversity. The cards, though, just seem to be stacked against the company. Now Avtex faces charges from the Virginia State Water Control Department that its Front Royal, Va., rayon plant is polluting the South Fork of the Shenandoah River with polychlorinated biphenyls (PCBs). The Shenandoah is a tributary of the Potomac River, a major water source for the Washington, D.C., area. Late last month the state police seized documents from the Avtex office as part of a criminal investigation to determine whether the company deliberately discharged PCBs into the river.

Virginia Attorney General Mary Sue Terry continues to pursue Avtex and has asked Virginia State Circuit Court Judge Theodore J. Markow in Richmond to shut down the Front Royal plant unless Avtex can prove it can afford to spend the millions of dollars the state estimates it needs for environmental repairs.

The latest charges are in addition to a slew of existing charges of air, water, and safety violations against the plant. They include a $9.1 million toxic wastewater cleanup ordered by the Environmental Protection Agency, aimed at Avtex and former plant owner FMC, and $9.3 million in repairs for numerous environmental and worker safety violations ordered by various state agencies, aimed at Avtex only. The chances that the plant will eke through its latest troubles and continue to operate are slimmer than ever.

Figuring out exactly what is happening at Avtex is not an easy task. Because the company is privately held, very little financial information about it is available. John N. Gregg, Avtex chairman and principal stockholder, isn't commenting about the firm and its plans. At one time, particularly when he worked on behalf of the U.S. textile industry—lobbying in Washington for the Fiber, Fabric & Apparel Coalition to secure passage of legislation to slow the importing of textiles—he frequently was accessible to the press. However, he hasn't been available recently because of illness.

Gregg did appear in a television interview the day the state identified Avtex as the source of PCB contamination. According to the *Front Royal-Warren Sentinel*, Gregg said that closing the plant "makes no sense." He added that there isn't any PCB contamination now and that any contamination that occurred was in the past.

Crutchfield: rising raw material costs

Avtex spokesman Jeff Nelson says the company is still analyzing the state's data on the level of PCBs in the river and has no comment at this time. According to Thomas M. Selvey, program manager for the Virginia Water Board and author of the agency's report on PCB contamination at Avtex, there are numerous electrical transformers on the sprawling 439-acre site that could contain PCBs. The water board took nine site samples and found that five of them tested positive for PCBs. One of these samples taken near a loading platform registered a PCBs contamination level of 78 ppm. The water board also sampled riverbank soil where water laps during high river flows, says Selvey. No PCB contamination was found up river from either Avtex's storm sewer or treated waste discharge pipes and the water board found no PCB contamination coming from either of these two sources.

But samples taken 200 feet down river from the two discharge pipes showed riverbank PCB contamination levels of 15.6 ppm, at 1000 feet 10.7 ppm, and at 1400 feet 38.3 ppm. Selvey's report concludes that "based on these samples, all sources of contamination can be eliminated except Avtex Fibers Inc. in the vicinity of outfalls [from the two pipes]."

The evidence appears damning but Avtex's Nelson says he is not convinced that the company is the source of the PCB contamination. Nelson adds that in June EPA discovered some PCB leaks outside the plant and that Avtex contractors are attending to those leaks now.

And Selvey says that the water board found no active source for the PCBs.

Avtex's Gregg has been resourceful in the past. Three times he has managed to resuscitate what seemed a terminally ill rayon operation. In 1976 he engineered a leveraged buyout of the former FMC Fibers division when no one else appeared to want the money-losing operation. In 1986 he negotiated salary concessions from the plant's 1300 unionized workers and avoided a shutdown. And in November 1988 he closed the plant for three days until the Department of Defense and the National Aeronautics & Space Administration helped the company come up with $20 million.

Some would say that when Gregg closed down the plant in November he played his trump card. Avtex, it seems, was, and still is, the only qualified supplier of carbonizable rayon for missile and rocket nozzles. Manufacturers of those nozzles have only limited stocks on hand and were Avtex to shut its doors, the U.S. space program would experience delays. Avtex rayon is carbonized, impregnated with epoxy, and used to form exhaust nozzles for the space shuttle's rocket boosters. Carbonizable rayon also forms the heat shields for the leading edges of the shuttle's wings. Carbonizable rayon shortages would affect defense missile production as well, including the MX missile and the Midgetman missile.

Morton Thiokol is a major user of Avtex carbonizable rayon. With prompting from NASA and DOD, Morton Thiokol helped Avtex to reopen its Front Royal plant last November with an advance payment for the rayon necessary to build a larger stockpile. Recently it placed another order for 1 million lb of carbonizable rayon. But whether Avtex can keep the plant in operation and pay out millions of dollars in cleanup costs aside from its potential PCB cleanup obligations is open to conjecture.

At one time Avtex had sales of about $300 million annually, according to industry sources. This included sales of not only rayon, but also polyester filament produced at Lewistown, Pa., and polypropylene staple, also produced at the nearly 50-year-old Front Royal plant. Sales surely have dropped. In July the company ceased production of textile-grade rayon fibers, including high wet modulus rayon—a highly elastic, high-crimp fiber preferred by textile producers over regular rayon because of its comfort, durability, and stability even when wet. By discontinuing production on five of eight rayon lines and by laying off some 500 of about 1300 employees, Avtex hoped to reduce the amount of zinc and sulfates discharged into the South Fork of the Shenandoah River, thereby forestalling an earlier threat from the state of Virginia to shut down the plant entirely because of pollution problems.

Avtex says it did not shut down production of textile-grade rayon solely because of environmental problems. The fiber also wasn't profitable, it points out. Raw material costs have risen faster than they can be recovered. The company admitted as much last September when marketing president James E. Crutchfield told C&EN that long-term contracts along with fierce market competition severely limited Avtex's ability to pass along raw material increases to customers (C&EN, Sept. 19, 1988, page 16). He cited, particularly, rising prices for caustic soda and dissolving pulp. In 1988, caustic soda prices rose 40% over 1987, according to the Department of Labor. At the same time, rayon prices rose only 9.7%. In June, the latest month for which statistics are available, caustic soda prices were up 31% from June 1988, while rayon fiber prices were up 10% higher for the same period.

Last November when he temporarily shut down the Front Royal plant, Gregg cited raw material costs as the most important factor. "Ironically, we are closing with a backlog of orders. But at the price we had to pay for pulp, we weren't making a profit," Gregg stated at

BASF, Courtaulds ready to step in with rayon

When Avtex Fibers shut down its textile fiber production in July, it withdrew a supply of at least 80 million lb of high wet modulus fiber from the textile apparel and home furnishings trade. Competitors BASF and Courtaulds are attempting to fill the void.

According to BASF Fibers director of rayon products R. Jack Higdon, the company is planning to double its current capacity of 20 million lb of high wet modulus fiber. However, the additional capacity will not be available until mid-1990. This represents little solace for fabric weavers, who currently have orders to fill and must scramble to find sufficient amounts of suitable rayon yarn or substitutes. Still it does offer some hope for the future.

Higdon says that BASF will run its rayon lines at capacity to meet market demand. Industry sources estimate BASF's rayon fiber capacity at 115 million lb at its plant in Lowland, Tenn. Higdon adds that BASF has no firm plans to add new capacity, but is considering that option for the future.

At Courtaulds Fibers, the North American arm of the diversified British fibers supplier, Derek F. Twogood, president, says the company will be increasing its rayon capacity 20%. This represents additional lines at plants in both Mobile, Ala., and Cornwall, Ontario, Canada. Industry sources put the U.S. plant's capacity at about 202 million lb. Courtaulds' investment at its Mobile facility will amount to more than $10 million and will result in a new production line at the plant.

Twogood says, however, that Courtaulds has no direct replacement for the high wet modulus rayon capacity lost with the Avtex shutdown in July. Courtaulds has, he claims, perfected a 1.1-denier rayon fiber for light print cloth. As a result, the company hopes to supply the 1.1-denier product as a replacement for high wet modulus fiber.

October will be a critical time for rayon demand as textile makers gear up production, Twogood points out. There will be a few headaches, he admits. Inevitably, many will switch to cotton. But the Avtex shutdown "will not be catastrophic," he says, for between Courtaulds' U.S., Canadian, and U.K. rayon fiber operations and BASF's resources, the industry will get most of the rayon supplies it needs.

Rayon prices have been stable relative to competitive fibers, but squeezed lately by raw material caustic soda

Producer price index[a]	1988	1987	1986	1985	1984	1983	Annual change 1987–88	Annual change 1983–88
Rayon	105.3	96.0	93.2	94.5	97.3	97.3	9.7%	1.6%
Raw cotton	95.5	105.8	88.0	97.7	113.5	114.0	−9.7	−3.5
Polyester	88.3	82.0	81.5	87.4	98.3	95.5	8.3	−1.6
Caustic soda	74.4	53.0	49.8	60.8	59.9	75.5	40.4	−0.3

a 1982 = 100. Source: Department of Labor

the time. The pollution problems, he said, "played a small part in our decision to close." Gregg also charged that the company's major domestic competitors, BASF and Courtaulds, imported dissolving pulp from South Africa, allowing them to undercut the price Avtex had to pay for the higher quality U.S. and Canadian pulp it uses in its plant.

BASF and Courtaulds also market other fibers and thus are not tied to the rayon fiber business cycle. BASF, for instance, had 1988 worldwide sales of about $25 billion. Its North American fibers unit, which includes nylon, acrylic, and rayon, contributed some $912 million to this total. Courtaulds' fiscal 1988 worldwide sales amounted to about $3.9 billion and its worldwide fiber sales $670 million, including acrylic, acetate, and rayon.

In addition to competition from BASF and Courtaulds, Avtex faces the problem that textile manufacturers resist higher fiber prices. Textile makers can substitute cotton for rayon. They began to do so after Courtaulds suddenly closed down its rayon fiber operation in November and, because of the uncertainty of supply created, were prepared when Avtex shut its textile-grade rayon fiber production in July.

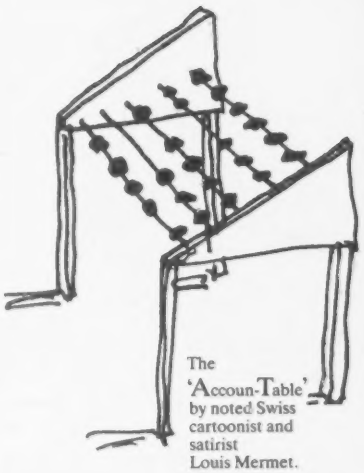
Avtex long has believed that its strong suit is its position as a specialty fibers producer. However, the fact that Avtex was a primary supplier of a specialty grade of rayon for the textile industry hasn't been a panacea. In addition to its carbonizable rayon, it is the major source of high wet modulus rayon fiber. Its capacity for this fiber is estimated to be about 80 million lb. Industry sources put BASF's high wet modulus rayon fiber production at about a fifth of Avtex's. Because of its high wet modulus fiber, Avtex has been the preeminent supplier of rayon for the apparel industry, according to industry sources. This is little comfort, however, if textile makers resist paying the price and can fall back on readily available substitutes.

Still, Avtex believes that rayon sold from its three remaining lines will command a price allowing it to turn a solid profit, according to Nelson. In addition to carbonizable rayon, the company also sells fiber for medical uses, he says.

Avtex has been forced to retrench before in the face of declining demand. It shut down an estimated 55 million lb acetate yarn plant in

Front Royal plant has had checkered history

The Front Royal rayon plant has a long and, more recently, troubled history. It was built in 1938 by American Viscose Co., a subsidiary of the U.K.'s Courtaulds. However, during World II Courtaulds had to give up American Viscose when England pledged its subsidiary's stock to the U.S. government as part of the lend-lease agreement. During the 1940s and 1950s American Viscose was a publicly held company and employed as many as 3000 people in the Front Royal plant. The company was profitable during these years as well as in 1961 when it sold the plant to FMC. However, in 1976 when John N. Gregg, then FMC Fibers division vice president and now Avtex Fibers' chairman and principal stockholder, engineered its purchase to form Avtex, the plant was in the red. Avtex has operated the plant profitably until recently, when it was beset by cost and pollution problems.



The 'Accoun-Table' by noted Swiss cartoonist and satirist Louis Mermet.

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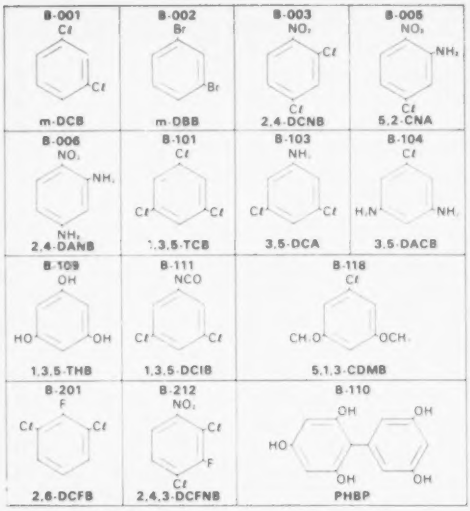

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Meadville, Pa., in 1985. Hoechst Celanese and Eastman Chemical are now the only producers of the fiber. In many instances polyester yarn has supplanted acetate in apparel and home furnishings applications. That same year Avtex sold its 1.5 million lb vinyon fiber operation to Celanese (now Hoechst Celanese).

Avtex has had a profound effect on Front Royal and the surrounding counties from which it draws its employees. When the Front Royal plant with its $25 million annual payroll almost closed three years ago, it was saved only when union employees agreed to grant the company wage concessions of more than $1.00 an hour.

Again last November employees were confronted with the uncertainty of not knowing where they would receive their next paycheck. At the time Gregg told reporters that he suffered along with them. "I have 1300 people and somebody has got to take care of them. Somebody has got to get them a job." A panic nearly took place at the Front Royal Federal Credit Union when depositors feared that the closing of the plant meant the closing of the credit union. The credit union had been founded by the local textile workers union. Today, however, it is a community credit union and not associated with either Avtex or the union.

The 500 rayon workers laid off this summer currently are seeking federal assistance under a program that would retrain workers who have lost their jobs because of imports. The Labor Department has not ruled on that request yet.

Avtex still may be able to survive. Although its Lewistown, Pa., polyester plant has a few environmental problems affecting a landfill, it is not caught up in the Front Royal controversy. Company officials say the Lewistown plant is consistently profitable. Avtex recently closed its sales offices in New York City and Charlotte, N.C., eliminating about 40 jobs. Corporate offices and senior sales and marketing personnel remain in Valley Forge, Pa. The question remains, however: Can it survive as a smaller company in the face of its environmental problems? □

Global-Change Plan To Coordinate Agencies' Environmental Research

Bush program directs spending for global-change research program; goal is to give policymakers sound bases for decisions on environment

Given the mounting evidence that human activities are changing the environment on a global scale, the Bush Administration has devised a strategy for research on global change. The plan—released by the White House in early September—embodies a significant attempt to coordinate federal agency research on monitoring, understanding, and ultimately predicting global change (C&EN, Sept. 11, page 6).

Presidential science adviser D. Allan Bromley said in releasing the report that the plan represents both his and President Bush's commitment to increasing understanding of the complex problem. The goal of the research program is to provide a sound scientific basis so that policymakers can make decisions on global-change issues such as ozone depletion, climate warming, desertification, and acid rain.

"The U.S. Global Change Research Program" was put together by the Committee on Earth Sciences (CES), part of the President's Office of Science & Technology Policy. The committee, chaired by U.S. Geological Survey head Dallas L. Peck, consists of representatives from a dozen federal agencies.

CES members worked with the National Academy of Sciences' (NAS) Committee on Global Change to hash out priorities for the $191 million the Bush Administration has proposed spending for global-change research in fiscal 1990. That amount,

C&EN staff photo

Corell: sets up framework of priorities

spread across seven federal agencies, represents an increase of 43% over 1989 appropriations. As Congress nears its Oct. 1 deadline for finalizing the budget, it looks likely that the budget request will be enacted.

The report defines the key scientific questions that global-change research must answer, surveys what research programs are now in place, and details what gaps need to be filled and what agency or agencies can best fill them. "The plan is the first time we've attempted to set up a framework of priorities within which we all agree to function," says Robert W. Corell, assistant director for geosciences at the National Science Foundation.

According to the report, the answers to three scientific questions could help distinguish changes in the global environments that are caused by humans from those that are the result of natural variability:

- What global changes have occurred in the past and are occurring now?
- What physical, geological, chemical, biological, and social processes are involved in influencing global change and its environmental impact?
- How well can global change and its impacts be predicted?

To answer those questions, Corell points out, requires scientific research at the interfaces of such traditional disciplines as physics, chemistry, geology, and biology. Accordingly, the White House plan groups research activities into seven interdisciplinary scientific elements that are ranked in terms of importance. The plan gives highest priority to research on climate and hydrologic systems, followed by biogeochemical dynamics, ecological systems and dynamics, Earth system history, human interactions, solid earth processes, and solar influences.

Within each of the main areas of inquiry, the plan assigns priorities to various research activities. For example, the role of clouds and ocean circulation and heat flux is given the highest priority under climate and hydrologic systems.

Federal agencies will spend $191 million on global-change research

$ Millions	Research focused on global change	Related research	Total
NSF	$ 53.5	$ 120.0	$ 173.5
EPA	35.3	58.9	94.2
Energy	27.2	46.5	73.7
USDA	22.7	154.2	176.7
NASA	21.5	412.6	434.1
Commerce	20.0	382.8	402.8
Interior	11.3	204.5	215.8
Defense	0	32.3	32.3
TOTAL	$191.5	$1411.8	$1603.1

Note: Proposed budget for fiscal 1990.

The research plan looks in detail at the strengths and weaknesses of current programs that address global change. Specific recommendations for agency activity in 1990—and outlines for later years—are spelled out. The National Oceanic & Atmospheric Administration (NOAA, part of the Department of Commerce), for example, would study how the circulation of ocean currents and oceanic uptake of greenhouse gases influence climate change. At the same time, USGS would study climate changes throughout Earth's history and NSF would support academic studies of Greenland ice cores for clues to conditions of ancient climates and atmospheres.

However, the integrated research plan does not include formulation of policies regarding global change nor does it address research and development of new technologies to adapt to or to mitigate environmental changes. Those gaps are serious omissions, says John C. Topping Jr., head of the Washington, D.C.-based Climate Institute.

"What the research plan recommends is important, but it doesn't focus on some very practical aspects of the problem," Topping says. "I think we need a greater flow of resources across the board." The Climate Institute has recommended that another $170 million in funds be spent in fiscal 1990 to tackle such questions as how to deal with rising sea levels caused by global warming.

The Administration has budgeted another $1.4 billion for fiscal 1990 programs that aren't strictly part of the global-change research plan but that support related activities—such as NSF's atmospheric chemistry program and NOAA's weather satellites. And although not part of the comprehensive White House research plan, the Environmental Protection Agency recently asked NAS' Committee on Science, Engineering & Public Policy to study the policy implications of greenhouse warming. The panel's report, expected in 1990, will assess technical, economic, and political factors affecting policies for mitigating or adapting to global change.

Pamela Zurer

Federal Alert—new legislation

This C&EN listing highlights legislation introduced between June 29 and Sept. 7. House and Senate bills are listed under subject area by bill number, primary sponsor, and the committee(s) to which they were referred.

HOUSE

Climate. H.R. 3143—AuCoin (D.-Ore.). Establishes national energy policy to reduce global warming. Energy & Commerce; Science, Space & Technology.

Education. H.R. 2957—Traficant (D.-Ohio). Establishes National Academy of Space, Science & Technology modeled after military academies. Science, Space & Technology.

H.R. 3122—Price (D.-N.C.). Sets up new programs at National Science Foundation aimed at combating scientific illiteracy. Science, Space & Technology.

Environment. H.R. 3030—Dingell (D.-Mich.). Administration proposal for attaining national air quality standards, controlling toxic air pollutants, preventing acid deposition. Energy & Commerce.

H.R. 3108—Eckart (D.-Ohio). States that Environmental Protection Agency must, within 10 years, require installation of maximum available control technology on major sources of air toxic emissions, establish programs to deal with emissions from area sources and sudden catastrophic release of air toxics. Energy & Commerce.

Health. H.R. 2808—Kostmayer (D.-Pa.). Requires schools to test for radon contamination. Energy & Commerce.

H.R. 3004—Evans (D.-Ill.). Provides for presumption of service connection between certain diseases experienced by veterans and exposure to toxic herbicide agents used in Vietnam. Veterans' Affairs.

H.R. 3067—Gaydos (D.-Pa.). Establishes system for identifying, notifying, and preventing illness and death among workers who are at increased or high risk of occupational disease. Education & Labor.

Museums. H.R. 3154—Brown (D.-Calif.). Requires National Science Foundation to establish science museum assistance program. Science, Space & Technology.

Patents. H.R. 2946—Kastenmeier (D.-Wis.). Provides that any invention made, used, or sold on space vehicles under U.S. jurisdiction or control shall be deemed to have been made or used in the U.S. Judiciary.

Research. H.R. 2793—Brown (D.-Calif.). Requires Secretary of Energy to develop comprehensive R&D program promoting use of hydrogen as fuel, authorizes $155 million over five years for research. Science, Space & Technology.

H.R. 2984—Roe (D.-N.J.). Gives Office of Science and Technology Policy's Committee on Earth Sciences permanent responsibility for coordinating, planning federal research efforts on global warming phenomena, calls for international agreements on funding for such research, development of safe energy technologies. Science, Space & Technology; Foreign Affairs; Merchant Marine & Fisheries.

Waste. H.R. 2485—Wyden (D.-Ore.). Allows states that have recycling program to refuse to accept wastes from states that don't, sets new standards for packaging, allows Environmental Protection Agency to prohibit use of certain packaging materials. Energy & Commerce.

H.R. 2967—Bonior (D.-Mich.). Grants state and local governments authority to enact laws to accept or reject solid waste from other states. Energy & Commerce.

H.R. 3105—Douglas (D.-N.H.). Encourages development, use of recyclable consumer plastics, sets up national labeling system for plastic consumer products. Science, Space & Technology.

Weapons. H.R. 3033—Fascell (D.-Fla.). Controls export of items necessary to produce or deliver chemical or biological weapons to countries trying to develop such capabilities, provides for sanctions against companies that aid in proliferation of such weapons. Foreign Affairs; Ways & Means; Banking, Finance & Urban Affairs.

SENATE

Environment. S. 1378—Gorton (R.-Wash.). Makes all persons responsible for oil, hazardous substance spills strictly liable for full costs of cleanup, restoration, or damages; provides for civil penalty equal to full costs of cleanup and restoration in cases of negligence. Environment & Public Works.

Liability. S. 1400—Kasten (R.-Wis.). Sets uniform national standards for product liability cases. Commerce, Science & Transportation.

Nuclear. S. 1304—Glenn (D.-Ohio). Requires Occupational Safety & Health Administration, National Institute for Occupational Safety & Health to regulate and oversee worker safety and health activities at Department of Energy nuclear weapon facilities; requires enforceable compliance and cleanup agreements for each facility to be in place within 18 months. Energy & Natural Resources.

Patents. S. 1529—Rockefeller (D.-W.Va.). Requires patent commissioner to draw up list of countries, including Japan, that do not adequately protect U.S. patents; states that International Trade Commission when hearing patent infringement cases involving listed countries can no longer consider any other factors; automatically implements ITC decisions in such cases. Finance.

Taxes. S. 1506—Bentsen (D.-Tex.). Limits ability of corporations to claim tax refunds resulting from leveraged buyouts and similar financial transactions involving debt. Finance.